

Listing of the Claims:

1. (Currently Amended) An apparatus suitable for use in investigating multi-phase biological tissue histology, ~~which apparatus comprises~~ comprising:

a trans-ductally deployable probe mounted on ~~mounting~~ a periodically displaceable body of at least one tactile sensing device, said periodically displaceable body having an excitation frequency bandwidth in the range of from 1 Hz to 500 KHz, a maximum stroke length of less than 1 mm and a displacement force in the range from 0.01 N to 1 N[[,]]; ~~said displaceable body being provided with~~ a displacement device having a displacement controller configured to control ~~for controlling~~ at least said excitation frequency of the periodically displaceable body[[,]]; and

~~said displaceable body being coupled to a displacement monitoring device and a displacement force monitoring device, both coupled to the periodically displaceable body and configured to monitor~~ for monitoring the a viscoelastic response of said biological tissue to periodic compression by said displacement force applied to said tissue by periodic displacement of said periodically displaceable body.

2. (Currently Amended) The ~~An~~ apparatus according to claim 1 wherein said probe is configured ~~formed and arranged so as to be~~ trans-ductally deployable in at least one of a ~~the~~ genito-urinary tract in males and females, a ~~the~~ gastro-intestinal tract, a ~~the~~ respiratory tract, and within an ~~the~~ arterial and venous vasculature system.

3. (Currently Amended) The ~~An~~ apparatus according to claim 1 ~~for trans-urethral deployment~~, wherein and said probe, when used for trans-urethral deployment, has a diameter of not more than 5mm.

4. (Currently Amended) The ~~An~~ apparatus according to claim 3 wherein said probe has a length of from 1 to 3 cms.

5. (Currently Amended) ~~The An~~ apparatus according to claim 1 wherein said periodically displaceable body is actuated via at least one of: a pressurized fluid circuit, a mechanical drive system, and a piezoelectric actuator.

6. (Currently Amended) ~~The An~~ apparatus according to claim 1 wherein said probe is mounted at the distal end of an elongate, ~~trans-ductally deployable~~, deployment device.

7. (Currently Amended) ~~The An~~ apparatus according to claim 6 wherein said periodically displaceable body is actuated by a proximally mounted motor.

8. (Currently Amended) ~~The An~~ apparatus according to claim 6 wherein said periodically displaceable body is actuated by a distally mounted motor drivingly connected to the displaceable body via said elongate deployment device.

9. (Currently Amended) ~~The An~~ apparatus according to claim 1 wherein said periodically displaceable body comprises at least one micro-piston actuated via a pressurized fluid circuit.

10. (Currently Amended) ~~The An~~ apparatus according to claim 1 wherein said periodically displaceable body comprises:

at least one shoe;

~~mounted on~~ a piezoelectric device mounted on each of the at least one shoe; and

~~sandwiched between said shoe and~~ a stress detector element sandwiching the piezoelectric device against the at least one shoe, the stress detector element configured to monitor, ~~formed and arranged for monitoring strain on the piezoelectric device and therein,~~ thereby to determine the force applied by said periodically displaceable displacement body to the biological tissue contacted thereby in use of said apparatus.

11. (Currently Amended) The An apparatus according to claim 1 wherein the periodically displaceable body has a at least one of the area of the force-transmitting surface of the displaceable body, used to apply force to the tissue in use of the apparatus, and and is configured such that an area of the surface and a the magnitude of the force applied to by the periodically the displaceable body[[,]] is formed and arranged so as to be user-adjustable.

12. (Currently Amended) The An apparatus according to claim 1 wherein said displacement device incorporates an actuator whose position is controlled whereby a signal of the position of in the control signal for said actuator may be used to monitor displacement of the periodically displaceable body.

13. (Currently Amended) The An apparatus according to claim 1 wherein a force detector is incorporated in at least one of the ~~displaceable body~~ displacement controller, the displacement device force source, and the periodically displaceable body itself.

14. (Currently Amended) The An apparatus according to claim 1 wherein ~~theis provided a displacement controller is configured to operate the periodically displaceable body at a~~ formed and arranged for application of selected ones of plurality of different excitation frequencies.

15. (Currently Amended) The An apparatus according to claim 1 wherein ~~theis provided a displacement controller is configured to control~~ formed and arranged for controlling each of said excitation frequency and stroke length.

16. (Currently Amended) The An apparatus according to claim 1 further comprising: [[,]] which includes

a position control device configured to change a for changing the position of the periodically displaceable body within a body duct, [[in]] during use of the apparatus, so as to successively bring [[it]] the periodically displaceable body into contact with a plurality of

different duct surface portions.

17. (Currently Amended) The An apparatus according to claim 1 further comprising: which includes

a processing unit configured to process ~~formed and arranged for processing~~ displacement and displacement force data and so as to generate at least one of dynamic modulus and Amplitude Ratio.

18. (Currently Amended) A method for producing a histological profile of a biological tissue adjacent a duct comprising the steps of:

- a) providing an apparatus according to claim 1;
- b) transductally inserting the probe of said apparatus to bring the periodically displaceable body of said probe into contact with a ~~the~~ ductal surface of said biological tissue at a plurality of positions across said ductal surface;
- c) subjecting said periodically displaceable body to a periodic displacement at an excitation frequency bandwidth of from 1 Hz to 500 kHz, a maximum stroke of less than 1 mm and a displacement force in the range of from 0.01 N to 1 N ~~so as to periodically force in the range of from 0.01 N to 1 N so as to~~ thereby periodically compressing ~~compress~~ said biological tissue at said contact positions across said ductal surface;
- d) monitoring the viscoelastic response of said tissue at each of said ~~surface~~ contact tissue positions to the compressing ~~compression~~ by said periodically displaceable body; and
- e) generating a profile of the viscoelastic response of the tissue across said ductal surface.

19. (Currently Amended) The A method according to ~~as claimed in~~ claim 18 further comprising ~~which includes the~~ a preliminary step of:

determining values of displacement frequency, displacement stroke length and displacement force suitable for histological profiling of a ~~the~~ type of biological tissue to be

profiled.

20. (Currently Amended) ~~The A method according to as-claimed in claim 18,~~
wherein ~~said displacement body is contracted with a~~ said plurality of tissue surface contact
positions ~~are, which plurality is distributed axially and/or circumferentially of said duct.~~

21. (Currently Amended) A method of diagnosing a condition manifested by
a histological abnormality in biological tissue adjacent a body duct comprising the steps of:

- a) providing an apparatus according to claim 1;
- b) trans-ductally inserting the probe of said apparatus to bring the
periodically displaceable body of said probe into contact with a the ductal surface of said
biological tissue at successive ones of a plurality of positions across said ductal surface;
- c) subjecting said periodically displaceable body to a periodic displacement
at an excitation frequency bandwidth of from 1 Hz to 500 kHz, a maximum stroke length of less
than 1mm and a displacement force in the range of from 0.01 N to 1 N thereby periodically
compressing so as to periodically compress said biological tissue at said contact positions across
said ductal ~~surface~~ surface;
- d) monitoring the viscoelastic response of said tissue at each of said tissue
~~surface-contact positions to the compressing compression-by~~ said periodically displaceable body;
- e) generating a profile of the viscoelastic response of the tissue across said
ductal surface; and
- f) comparing said generated viscoelastic response profile with viscoelastic
response profiles of such tissue having known histological characteristics.